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Douglas Fir Beetle
Survey

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WORK PLAN

SURVEY OF DOUGLAS-FIR BEETLE POPULATIONS IN WINDTHROWN TIMBER IN OREGON AND WASHINGTON 1963

by

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INTRODUCTION

A severe storm struck the coast of Oregon and Washington on October 12, 1962. Winds in excess of 100 miles per hour resulted in more than 11 billion board feet of timber being blown down. Orr reported that 6-1/2 billion board feet of sawtimber was blown down in concentrated patches and an additional 4-1/2 billion feet went down as individual trees and in small scattered groups throughout the timber stands in both States.1/

Douglas-fir trees blown down or damaged during this storm are a potential hazard for producing large broods of the Douglas-fir beetle. The history of such storms in the past shows that beetles frequently develop in the windthrown timber and emerge to attack surrounding green trees. Following a 9 billion board foot blowdown in Oregon and Washington in the early 1950's, over 3 billion board feet of timber were killed by the Douglas-fir beetle. On other occasions following windstorms, little or no beetle activity developed from the windthrown timber.

The current blowdown presents the question--will a beetle outbreak develop in 1964 or 1965--and if so, is there more danger of outbreaks in some areas than there is in others? A survey of beetle populations is required so that timber salvage as a control measure may be concentrated in the areas with the greatest hazard.

1/ Orr, P. W. Windthrown timber survey in the pacific northwest, 1962. U. S. Forest Serv., Pacific Northwest Region, 22 pp., illus. March 1963.

OBJECTIVE

The objective of this survey will be the semi-systematic sampling of Douglas-fir beetle populations developing in windthrown trees. These population figures will be compiled by geographical units and studied in an effort to assess the hazard to the surrounding green trees in 1964. If such a hazard is present in some or all of the units, an attempt will be made to predict in which unit or units there is the greatest chance of a beetle outbreak developing. Steps can then be taken to concentrate salvage operations in these areas.

PROCEDURE

When

Population counts will be made between Monday, August 19 and Friday, November 8.

Where

The blowdown area in Oregon and Washington containing Douglas-fir stands has been divided into eight geographical units. Three of these units are in Washington and five are located in Oregon. Location and numbers of these units are marked on the attached map. Surveys will be conducted and results compiled separately for each of them. If resulting figures warrant it, the units may be broken down into smaller compartments for control recommendations.

Who

A two-man survey crew will be assigned to each unit for a three-week period. Thus, 24 crew weeks or 240 man-days will be required for supervision and 15 man-days to prepare the reports and maps.

Three men will be available for three weeks each when the European pine shoot moth survey ends on September 6. It is expected that four men will be available from the looper project on August 19. If these men can stay until September 27, then only additional manpower for 75 man-days need be hired.

How

In each blowdown unit, two men will spend three weeks collecting data on the sample plots. The number of these plots in each unit will vary with the sampling ability of the crews, ease of travel, and density of beetle attacks. If the survey makes rapid progress in one unit, it may be possible to cut the survey period short in that unit and transfer the men into a more difficult unit.

A map of each unit showing the generalized areas of windthrown timber will be supplied each crew. In each township in the unit showing any windthrow on the map, one to three plots will be established. If time permits, additional plots may be located in townships showing heavy (red) concentrations on the map.

Plot sampling procedure

1. Study the unit map and decide on the number of plots to do in each township.

2. On large-scale Forest Service, Bureau of Land Management, or State maps select the general location of the plots. Plots should:

    a. be located near a road to reduce travel time

    b. be in area marked on unit map as containing a concentration of blowdown timber

    c. be at least one mile from one another

    d. be in a heavy blowdown area if more than two plots are located in the township

    e. on line 1 of survey form, record the unit number in Roman numerals from unit map

    f. on line 2 record the plot number, numbering the plots in consecutive order as completed. Crews of agencies cooperating in the survey will prefix their plot numbers with a code number in the following manner:

        M - Bureau of Land Management

        O - Oregon State Department of Forestry

        R - Washington State Department of Natural Resources

        F - U. S. Forest Service

        W - Weyerhaeuser Company

    g. on line 3 record the range and township number in which the plot is located

    h. on line 4 record the number of the section in which the plot is taken.

3. Upon arrival at the plot location, proceed to the nearest windthrown Douglas-fir tree meeting the following requirements:

    a. must be in a horizontal or near horizontal position

    b. must have 90 percent of its roots detached from the soil

c. must be a whole tree or a section, at least 30 feet long

d. must be at least 12 inches in diameter and preferably 24 inches or larger at midbole.

4. When the tree has been selected, examine the most shaded side of the tree at midbole for external signs of Douglas-fir beetle attacks along a strip of bark one foot wide and ten feet long.

5. If no attacks are located on the first tree examined, repeat this procedure on other trees in a like manner until a beetle attack is located or until a total of 50 square feet of bark surface on five trees has been examined.

6. Record on line 5 of the survey form the number of trees examined without an attack.

7. If no attacks are located on five trees then mark 5 on line 5 and move on to the next plot location.

8. If an attack is found then:

   a. count the number of beetle attacks showing externally on the ten square feet of bark surface examined on the one foot by ten foot strip on the shaded side at midbole; record this count on line 6

   b. record on line 7 the diameter of the bole where the first attack was located

   c. remove a section of bark one foot square surrounding the first attack observed

   d. on line 8 record the minimum and maximum bark thickness of bark section removed; measure the maximum at the top of the ridges and the minimum at the bottom of the grooves

   e. measure and record on line 9 the total number of inches of egg gallery on the square foot of sampled bark area - this measurement will include egg galleries regardless of whether they have their origin on the sample and will include the aborted galleries

   f. measure and record on line 10 the number of inches of aborted egg gallery - an aborted gallery will be considered one that does not produce at least one larval mine one inch long

g. count and record on line 11 the number of larval galleries completed on the bark sample - a completed larval gallery is one that contains a living larva, pupa, or adult, or a mine that terminates in a hole bored into the bark

h. make an estimate of the percentage of the merchantable stand, 12 inches and above, that has been blown down within a quarter mile of the plot (include parts and tops of trees blown off in this estimate); record this percentage on line 12

i. on line 13 mark an "N" if no logging is in progress within a quarter mile radius of the plot; mark "P" if logging is in progress within this area, or a "C" if logging has been completed and the sample was taken in the remaining slash

j. take an elevation reading of the plot with an altimeter and record the reading on line 14

k. with a compass record on line 15 the slope on which the plot is located; if the area is so flat that the plot is exposed to sunlight all day then record flat on line 15

l. on line 17 record the date on which the survey was made

m. on line 18 record the initials of the crew members making the survey.

9. The survey crew will make an accurate copy of the survey card and forward it to:

Mr. David McComb
Division of Timber Management
U. S. Forest Service
P. O. Box 3623
Portland, Oregon 97208

The original survey card will be kept by the survey party.

10. All data collected during the survey will be made available to cooperating groups or other interested parties.

COST ESTIMATE

A two-man crew will spend three weeks surveying each of eight units. A total of 24 crew-weeks will be spent on the survey. The cost of a crew-week as figured is $320.00.

Figures for cost of crew week

Salary of crew leader @ GS-5	$ 95.00
Salary of crew member @ GS-4	85.00
Per diem for two men for average of five-day week @ $10.00	100.00
Transportation costs @ 600 miles per week	30.00
Equipment and miscellaneous	10.00
Total cost per crew-week	$ 320.00

Project costs

24 crew-weeks at $320.00	$7,680.00
Supervision costs	850.00
Training	250.00
Report and map preparation	200.00
	$8,980.00